

CLAIMS

What is claimed is:

Sub B1 >

1. An apparatus comprising:
 - 2 a storage circuit coupled to a prefetcher to store a plurality of prefetch addresses, the plurality of prefetch addresses corresponding to most recent access requests from a processor, the prefetcher generating an access request to a memory when requested by the processor; and
 - 6 a canceler coupled to the storage circuit and the prefetcher to cancel the access request when the access request corresponds to at least P of the stored prefetch addresses, P being a non-zero integer.

Sub C1 >

1. The apparatus of claim 1 wherein the storage circuit comprises:
 - 2 a storage element to store the plurality of prefetch addresses from the most recent access requests by the processor, the storage element being one of a queue with a predetermined size and a content addressable memory (CAM).

1. The apparatus of claim 2 wherein the queue comprises:
 - 2 a plurality of registers cascaded to shift the prefetch addresses each time the processor generates an access request.

1. The apparatus of claim 3 wherein the canceler comprises:

2 a matching circuit to match a current prefetch address associated with
3 the access request with the stored prefetch addresses.

1 5. The apparatus of claim 4 wherein the canceler further comprises:
2 a cancel generator coupled to the matching circuit to generate a
3 cancellation request to the prefetcher when the current prefetch address matches
4 to the at least P of the stored prefetch addresses.

1 6. The apparatus of claim 4 wherein the matching circuit comprises:
2 a plurality of comparators to compare the current prefetch address with
3 each of the stored prefetch addresses.

1 7. The apparatus of claim 4 wherein the matching circuit comprises:
2 a plurality of comparators to compare the current prefetch address with
3 contents of the plurality of registers, the comparators generating comparison
4 results.

1 8. The apparatus of claim 7 wherein the cancel generator comprises:
2 a comparator combiner coupled to the comparators to combine the
3 comparison results, the combined comparison results corresponding to the
4 cancellation request.

Sub C1 1 9. The apparatus of claim 2 wherein the canceler comprises:

2 a matching circuit having an argument register to store the current
3 prefetch address for matching with entries of the CAM.

1 10. The apparatus of claim 9 wherein the canceler further comprises:
2 a cancellation generator to generate a match indicator when the current
3 prefetch address matches at least P of the entries, the match indicator
4 corresponding to the cancellation request.

Sub B2 > 11. A method comprising:

2 storing a plurality of prefetch addresses in a storage circuit, the plurality
3 of prefetch addresses corresponding to most recent access requests from a
4 processor, the prefetcher generating an access request to a memory when
5 requested by the processor; and
6 canceling the access request when the access request corresponds to at
7 least P of the stored prefetch addresses, P being a non-zero integer.

Sub C1 > 12. The method of claim 11 wherein storing comprises:

2 storing the plurality of prefetch addresses in one of a queue with a
3 predetermined size and a content addressable memory (CAM).

1 13. The method of claim 12 wherein storing the plurality of prefetch
2 addresses in the queue comprises:

3 storing the plurality of prefetch addresses in a plurality of registers
4 cascaded to shift the prefetch addresses each time the processor generates a
5 prefetch request.

1 14. The method of claim 13 wherein canceling comprises:
2 matching a current prefetch address associated with the access request
3 with the stored prefetch addresses.

1 15. The method of claim 14 wherein canceling further comprises:
2 generating a cancellation request to the prefetcher when the current
3 prefetch address matches to the at least P of the stored prefetch addresses.

1 16. The method of claim 14 wherein matching comprises:
2 comparing the current prefetch address with each of the stored prefetch
3 addresses.

1 17. The method of claim 14 wherein matching comprises:
2 comparing the current prefetch address with contents of the plurality of
3 registers, the comparators generating comparison results.

1 18. The method of claim 17 wherein generating the cancellation
2 request comprises:

Sub a 2
3 combining the comparison results, the combined comparison results
4 corresponding to the cancellation request.

Sub C1

19. The method of claim 12 wherein canceling comprises:
2 storing the current prefetch address in an argument register for matching
3 with entries of the CAM.

Sub a 3
1 20. The method of claim 9 wherein canceling further comprises:
2 generating a match indicator when the current prefetch address matches
3 at least P of the entries, the match indicator corresponding to the cancellation
4 request.

Sub B3

21. A system comprising:
2 a processor to generate prefetch requests;
3 a memory to store data; and
4 a chipset coupled to the processor and the memory, the chipset
5 comprising:
6 a prefetcher to generate an access request to the memory when
7 requested by the processor;
8 a prefetch monitor circuit coupled to the prefetcher, the prefetch
9 monitor circuit comprising:

10 a storage circuit coupled to the prefetcher to store a plurality of prefetch
11 addresses, the plurality of prefetch addresses corresponding to most recent
12 access requests from the processor; and

13 a canceler coupled to the storage circuit and the prefetcher to
14 cancel the access request when the access request corresponds to
15 at least P of the stored prefetch addresses, P being a non-zero
16 integer.

*Sub
C1*

22. The system of claim 21 wherein the storage circuit comprises:

1 a storage element to store the plurality of prefetch addresses from the
2 most recent access requests by the processor, the storage element being one of
3 a queue with a predetermined size and a content addressable memory (CAM).

1 23. The system of claim 22 wherein the queue comprises:

2 a plurality of registers cascaded to shift the prefetch addresses each time
3 the processor generates an access request.

1 24. The system of claim 23 wherein the canceler comprises:

2 a matching circuit to match a current prefetch address associated with
3 the access request with the stored prefetch addresses.

1 25. The system of claim 24 wherein the canceler further comprises:

2 a cancel generator coupled to the matching circuit to generate a
3 cancellation request to the prefetcher when the current prefetch address matches
4 to the at least P of the stored prefetch addresses.

1 26. The system of claim 24 wherein the matching circuit comprises:
2 a plurality of comparators to compare the current prefetch address with
3 each of the stored prefetch addresses.

1 27. The system of claim 24 wherein the matching circuit comprises:
2 a plurality of comparators to compare the current prefetch address with
3 contents of the plurality of registers, the comparators generating comparison
4 results.

Sub out
1 28. The system of claim 27 wherein the cancel generator comprises:
2 a comparator combiner coupled to the comparators to combine the
3 comparison results, the combined comparison results corresponding to the
4 cancellation request.

Sub C1
1 29. The system of claim 22 wherein the canceler comprises:
2 a matching circuit having an argument register to store the current
3 prefetch address for matching with entries of the CAM.

1 30. The system of claim 29 wherein the canceler further comprises:

042390.P10571

- 2 a cancellation generator to generate a match indicator when the current
- 3 prefetch address matches at least P of the entries, the match indicator
- 4 corresponding to the cancellation request.